

Rejections under 35 U.S.C. §112, first paragraph

In the Office Action, claims 1-3, 5-13, 15, 16, and 18-20 stand rejected under 35 U.S.C. §112, first paragraph, for allegedly lacking enablement. As in the previous Office Action, the Examiner acknowledges that the application is enabling for production and use of recombinant constructs comprising the sarcotoxin1a gene.

As explained in the previous response, the first paragraph of §112, has never been interpreted to require specific demonstration of particular embodiments of an invention. In the present case, applicants respectfully submit that the Examiner has again failed to provide sufficient evidence or reasoning to explain why one of skill could not practice the claimed invention using the present specification and standard techniques. As explained previously, routine screens to identify other genes within the scope of the claims were well known at the time of the invention. Indeed, applicants presented specific evidence in the form of the Epple *et al.*, publication demonstrating that such genes could have been identified using standard screening techniques. In particular, this reference shows that a transgenic plant conferred with resistance to fungi was produced by the same procedure. Based on this reference, it is clear that those skilled in the art could readily select appropriate control sequences, vectors, expression conditions, and the like for the expression of genes within the scope of the claims, based on the disclosure of the specification.

In the absence of a showing that routine, although laborious, experimentation could not be used to identify other genes within the scope of the claims and test transgenic plants for desired traits, the rejection of the pending claims is improper and should be withdrawn.

Rejections under 35 U.S.C. §112, second paragraph

Claims 1, 5, 6, 9, 10, 12, 13, 14, 15, 16, 17, and 20 were rejected for allegedly being indefinite. All of these rejections are overcome by the above amended claims. In addition, claims 7, 8, 11, and 19 have been amended to further clarify the claimed subject matter. None of the amendments add new matter. Withdrawal of the rejection is respectfully requested.

Rejections under 35 U.S.C. §102

The rejection of claims 1 and 20 for allegedly being anticipated by Broekaert *et al.* is respectfully traversed. As noted previously, the present invention is based, at least in part, on the discovery that genes that encode anti-bacterial peptides can be used in plants to confer anti-fungal properties. The cited patents simply disclose "anti-microbial" or "biocidal" peptides, but teach nothing regarding whether these peptides would be useful in conferring resistance to fungal pathogens. The Examiner has identified nothing in the prior art that discloses or suggests this invention.

Indeed, in the subject application, transgenic plants conferred with anti-fungal activity were actually produced and confirmed to exhibit this activity (see Examples 5 and 6). The prior art references cited by the Examiner fail to disclose or suggest that such activity could be obtained. Jaynes *et al.* discloses that plants transformed with a gene encoding a membrane lysis peptide such as atacin, lysozyme and cecropin, showed resistance to bacteria. However, Jaynes *et al.* did not confirm anti-fungal property of the plants. Broekaert *et al.* used AFF and AMP to transform plants. These proteins were isolated as biocidal agents. However, there is no disclosure in this article that a plant with resistance to fungi was actually obtained.

More specifically, the transgenic plant described in the Jaynes *et al.* article showed resistance to bacteria such as *Pseudomonas syringae* (see Jaynes *et al.*, columns 18, 19 and 20), which are classified in Procaryomycota. In contrast, the claimed transgenic plants show resistance to fungi, such as *Rhizoctonia solani* AG-4 1272, *Pythium aphanidermatur* and *phytophthora infestans*, which are classified in Eucaryomycota.

Fungi are completely different organisms from bacteria, in terms of the morphology and life cycle. Indeed, if bacteria are considered analogous to fungi, plants should be considered to be related to human beings! As known in the pharmaceutical field, an anti-bacterial material is not necessarily expected to have an anti-fungal activity. Therefore, transgenic plants with anti-fungal activity are completely different from plants having an anti-bacterial plant. Applicants respectfully submit that the anti-fungal property of the plants in the cited references are merely estimations based on wishful prediction. It should not be regarded that these references disclose the claimed invention.


With regard to claim 12, the presently claimed invention is characterized in that an anti-bacterial gene and a plant gene are operably linked via a hinge region of a tobacco chitinase gene. It is well known that large amounts of a short peptide, such as Sarcotoxin 1a, (which has molecular weight of 7,000 or less) cannot accumulate in plants. This is because short peptides are likely to be degraded in a plant cell (see Specification, page 1, lines 15-25). The anti-bacterial gene recited in amended claim 12 is operably linked to a plant gene product via a hinge region of a tobacco chitinase gene. The claimed construct makes it possible to avoid steric hindrance between the anti-bacterial peptide and the plant gene product, and provide stability to both the peptides in a plant body. Thus, the anti-bacterial peptide can be accumulated in a large amount. Neither of the cited references describe or teach such use of a hinge region of tobacco chitinase gene.

In light of the above, applicants respectfully submit that the claimed invention has not been disclosed or suggested by the prior art cited by the Examiner. Withdrawal of the rejection is respectfully requested.

CONCLUSION

In view of the foregoing, Applicants believe all claims now pending in this application are in condition for allowance. The issuance of a formal Notice of Allowance at an early date is respectfully requested. If a telephone conference would expedite prosecution of this application, the Examiner is invited to telephone the undersigned at (415) 576-0200.

Respectfully submitted,


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